E Chowdhury et al /J. Pharm. Sci. & Res. Vol. 15(8), 2023, 1213-1214

ISSN:0975-1459
Journal of Pharmaceutical Sciences and Research
www.jpsr.pharmainfo.in

Comparison of Effectiveness of Closed and Open Reduction of Condylar Fractures - A Literature Review

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Abstract:

Conservative treatment with closed reduction or surgical treatment with open reduction are both options for the management of mandibular condyle fracture. Condylar fractures in oral and maxillofacial injuries continue to be a matter of debate. Each form of condylar fracture requires a different approach to therapy, one that takes into account the patient's teeth, the height of the fracture, their adaptability, their masticatory system, any occlusal dysfunction, and the deviation of their mandible. Traditionally, condylar fractures were treated with closed reduction and concurrent vigorous physical therapy administered following intermaxillary fixation during the healing period. Recently, however, open treatment of condylar fractures with rigid internal fixation has become more prevalent. The goal of this review was to assess the key factors that influence whether condylar fractures should be treated using an open or closed technique, identifying their indications, benefits, and drawbacks. It also aimed to evaluate the most recent research on the efficacy of interventions used to treat fractures of the mandibular condyle.

Keywords: condyle, fractures, open reduction, closed reduction, intermaxillary fixation

INTRODUCTION:

While the repair of fractures in the majority of the mandible has definite parameters for when an open or closed reduction is necessary, How to treat condylar process fractures most effectively is still up for dispute. This conundrum is caused in part by the inability to realign the parts using the occlusion, as is possible in the body of the mandible, and in part by the higher risk of open reduction due to the facial nerve's proximity to the operative wound. In this review, the major historical works that address the treatment of mandibular condyle fractures with open and closed reduction are discussed. The authors' goal was to give the reader an unbiased overview of how this type of injury is managed, to put that management in the context of today, and perhaps to lessen the appearance of conflict.

BACKGROUND:

"Conventional wisdom" has held for far more than 50 years that the best results for mandibular condyle fractures come from closed care. Sadly, based on remarks like "complications emerging from fractures of the mandibular condyle are noticeable by their absent," this is a misreading of the surgical knowledge.[1] Even though it was a cutting-edge study at the time, a detailed examination of this statement exposes altogether different views when held to the standards of contemporary surgical research.

In 1952, MacLennan examined "180 cases of typical fractures of the mandibular condylar process" and made the same finding about the absence of sequelae that was reported earlier. According to the findings, 79% of those patients underwent closed reduction and maxillomandibular fixation for a period of 0 to 14 days, while the remaining members of this population received observation, bandaging, wiring, a cast cap, splints, and direct wire as treatments. Post - operative problems included discomfort in two individuals, deviation in 29 patients, visible deformity in seven patients, and radiological deformity in 73 patients. So, it is possible to estimate the frequencies of complications as 2%, 24%, 6%, and 61 %, respectively [1].

According to Blevins and Gores' assessment, when mandibular fractures of the condylar were treated with closed reduction, 12 patients (13 percent) said they had good to outstanding results, while 20 (22 percent) said they had mild issues and 32 (36 percent) said they had considerable issues.[2] The review of 92 adult dentate individuals with fractures of the mandibular condyle was conducted by Silvennoinen et al (1994). The reduction in ramus height caused malocclusion in 12 patients (13%) and chronic mandibular deviation in four patients (4.4%), according to the investigators, who calculated a 17.4 percent overall risk of complications.[3]

The 1947 Chalmers J. Lyons Memorial Lecture was one of those inquiries that produced better outcomes. According to the data collected and recorded by Hayward and provided by Goodsell, 88 percent of the 120 patients who had mandibular condyle fractures were treated with closed reduction and maxillomandibular fixation, compared to 1 percent who had soft diet. Seven individuals (5.8%) were determined to have functional problems, according to the investigators.[4]

So, from this critical analysis of the literature on closed reduction versus open reduction, it is clear that difficulties resulting from the closed reduction of mandibular condyle fractures are actually apparent by their presence and not by their absence.

DISCUSSION:

A critical analysis of the most recent surgical literature appears to contradict the conventional knowledge of the past when comparing the outcomes of open reduction with closed reduction. According to Hidding et al research from 1999, only 10% of patients who underwent open reduction and internal fixation had deviation on opening, compared to 64% of patients who received conservative treatment.[5]

In their examination of 80 individuals with unilateral mandibular condyle fractures, Konstantinovic and Dimitrijevic These researchers discovered that all patients who had internal fixation and open reduction experienced reductions that ranged from 81 to 100 percent of ideal. For the group that received conservative treatment, 77 percent of reductions fell within that range, just 18.5 percent fell between 61 and 80 percent, and only 3.8 percent fell below the optimal reduction of 60 percent.[6]

The Ellis et al. series of nine articles provides the most thorough comparison of the results of open versus closed reduction of mandibular condyle injuries. [7-15] Altogether the following conclusions were made:

- There were no apparent clinical variations in mandibular mobility or muscle activation across the groups.
- Those who underwent open reduction and internal fixation were more mobile after surgery than those who underwent closed treatment.
- Postoperatively, the condylar position is not constant for either closed management or open reduction and internal fixation.
- Those who were operated using the closed method had a considerably greater proportion of malocclusion after three years (22.2 to 28.6%) than patients who were treated using the open reduction and internal fixation (0 percent).
- Patients who underwent closed reduction and internal fixation for condylar fractures had shorter posterior facial and ramus heights than those who underwent open reduction and internal fixation.
- In the open reduction group, facial nerve paralysis was shown to develop at a rate of 17.2 percent; however, all cases were cured by 6 months.
- Maximum bite forces did not differ across groups at any point during the research.

According to an analysis of the literature on the outcomes of the open and closed approaches, open reduction and internal fixation have been linked to scarring and a temporary (6-month) dysfunction of the marginal mandibular facial nerve branches, whereas closed reduction and maxillomandibular fixation have been linked to a variety of issues. Closed reduction and maxillomandibular fixation have a number of drawbacks, including persistent pain, malocclusion, asymmetry, restricted mobility, and severe radiographic abnormalities. According to this combined assessment, open reduction and internal fixation is the preferable method for similar symptoms and circumstances.

CONCLUSION:

Conservative treatment utilizing closed reduction and surgical intervention utilising open reduction are both used to treat mandibular condyle fractures. The patient's age, fracture type, systemic condition, additional fractures, teeth, likelihood of occlusal restoration via intermaxillary fixation, and presence of foreign materials should all be taken into consideration when choosing a treatment plan. The benefits, drawbacks, risks, and potential problems of any treatment should be adequately considered with patients and their legal guardians before the treatment plan is finalised.

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